

What is claimed is:

1. A system for determining positioning in an automated data storage library, said automated data storage library having a plurality of storage shelves for storing data storage media; at least one data storage drive for reading and/or writing data with respect to said data storage media; and at least one robot accessor for transporting said data storage media between said plurality of  
6 storage shelves and said at least one data storage drive; said robot accessor having at least one sensor, and said automated data storage library having at least one home position for said at least one robot accessor; said system comprising:
  - at least one reference point located at an expected location in said automated data storage library remote from said robot accessor home position; and
  - 11 at least one processor for operating said at least one robot accessor in accordance with a calibration system, said at least one processor, conducting a rezero operation,
    - moves said robot accessor sensor to said expected location of said at least one reference point; and
    - if said one reference point is sensed by said robot accessor sensor at substantially  
16 said expected location, said rezero operation is completed.

2. The system of Claim 1, wherein said at least one processor, during said rezero operation, if said one reference point is sensed by said robot accessor;

compares said sensed location of said one reference point to said expected location; and, if said comparison indicates an offset between said sensed location and said expected location of  
5 said one reference point, updates said calibration system with respect to said one reference point and said rezero operation is completed.

3. The system of Claim 1, wherein said at least one processor, during said rezero operation, if said one reference point is sensed by said robot accessor;

compares said sensed location of said one reference point to said expected location; if  
10 said comparison indicates an offset between said sensed location and said expected location of said one reference point, moves said robot accessor to a second expected location of a second reference point; and

if said second reference point is sensed by said robot accessor sensor at substantially said second expected location, updates said calibration system with respect to said one reference  
15 point, and said rezero operation is completed.

4. The system of Claim 1, wherein said at least one processor, during said rezero operation, if said one reference point is sensed by said robot accessor sensor;

compares said sensed location of said one reference point to said expected location of said one reference point;

5 if said comparison indicates an offset between said sensed location and said expected location of said one reference point moves, said robot accessor to a second expected location of a second reference point;

if said second reference point is sensed by said robot accessor sensor, but is offset from said second expected position;

10 determines whether said offset of said second reference point is consistent with said offset of said one reference point; and

if said offsets are consistent, updates said calibration system with respect to said one reference point and/or said second reference point, and said rezero operation is completed.

5. A system for determining positioning in an automated data storage library, said automated data storage library having a plurality of storage shelves for storing data storage media; at least one data storage drive for reading and/or writing data with respect to said data storage media; and at least one robot accessor for transporting said data storage media between  
5 said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor, and said automated data storage library having at least one home position for said at least one robot accessor; said system comprising:  
at least one unique reference at an unique location in said automated data storage library;  
and  
10 at least one processor for operating said at least one robot accessor in accordance with a calibration system, said at least one processor, conducting a rezero operation,  
moves said robot accessor sensor toward said unique location of said unique reference  
and/or said home position; and  
if said unique reference is sensed by said at least one robot accessor sensor,  
15 determines said unique location and completes said rezero operation.

6. The system of Claim 5, wherein said at least one processor, during said rezero operation, if said unique reference is found, moves said robot accessor to said home position at high speed.

7. The system of Claim 5, additionally comprising:

at least one reference point located at an expected location in said automated data storage

5 library remote from said robot accessor home position; and

wherein said at least one processor, additionally,

if said unique reference is sensed by said at least one robot accessor sensor,

employs said determined unique location to move said robot accessor sensor to said

expected location of said reference point; and

10 if said reference point is sensed by said robot accessor sensor at substantially said expected location, said rezero operation is completed.

8. An automated data storage library, comprising:

a plurality of storage shelves for storing data storage media;

at least one data storage drive for reading and/or writing data with respect to said data storage media;

5 at least one robot accessor for transporting said data storage media between said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor;

at least one home position for said at least one robot accessor;

at least one reference point located at an expected location in said automated data storage

10 library remote from said robot accessor home position; and

at least one processor for operating said at least one robot accessor in accordance with a calibration system, said at least one processor, conducting a rezero operation,

moves said robot accessor sensor to said expected location of said at least one reference point; and

15 if said one reference point is sensed by said robot accessor sensor at substantially said expected location, said rezero operation is completed.

9. The automated data storage library of Claim 8, wherein said at least one processor, during said rezero operation, if said one reference point is sensed by said robot accessor;

compares said sensed location of said one reference point to said expected location; and, if said comparison indicates an offset between said sensed location and said expected location of  
5 said one reference point, updates said calibration system with respect to said one reference point and said rezero operation is completed.

10. The automated data storage library of Claim 8, wherein said at least one processor, during said rezero operation, if said one reference point is sensed by said robot accessor;

compares said sensed location of said one reference point to said expected location; if said  
10 comparison indicates an offset between said sensed location and said expected location of said one reference point, moves said robot accessor to a second expected location of a second reference point; and

if said second reference point is sensed by said robot accessor sensor at substantially said second expected location, updates said calibration system with respect to said one reference point,  
15 and said rezero operation is completed.

11. The automated data storage library of Claim 8, wherein said at least one processor, during said rezero operation, if said one reference point is sensed by said robot accessor sensor;

compares said sensed location of said one reference point to said expected location of said one reference point;

5 if said comparison indicates an offset between said sensed location and said expected location of said one reference point, moves said robot accessor to a second expected location of a second reference point;

if said second reference point is sensed by said robot accessor sensor, but is offset from said second expected position;

10 determines whether said offset of said second reference point is consistent with said offset of said one reference point; and

if said offsets are consistent, updates said calibration system with respect to said one reference point and/or said second reference point, and said rezero operation is completed.



12. An automated data storage library, comprising:

a plurality of storage shelves for storing data storage media;

at least one data storage drive for reading and/or writing data with respect to said data storage media;

5 at least one robot accessor for transporting said data storage media between said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor;

at least one home position for said at least one robot accessor;

at least one unique reference at an unique location in said automated data storage library;

10 and

at least one processor for operating said at least one robot accessor in accordance with a calibration system, said at least one processor, conducting a rezero operation,

moves said robot accessor sensor toward said unique location of said unique reference and/or said home position; and

15 if said unique reference is sensed by said at least one robot accessor sensor, determines said unique location and completes said rezero operation.

13. The automated data storage library of Claim 12, wherein said at least one processor,

during said rezero operation, if said unique reference is found, moves said robot accessor to said

20 home position at high speed.

14. The automated data storage library of Claim 12, additionally comprising:  
at least one reference point located at an expected location in said automated data storage  
library remote from said robot accessor home position; and  
wherein said at least one processor, additionally,  
5 if said unique reference is sensed by said at least one robot accessor sensor,  
employs said determined unique location to move said robot accessor sensor to said  
expected location of said reference point; and  
if said reference point is sensed by said robot accessor sensor at substantially said  
expected location, said rezero operation is completed.

10 15. The automated data storage library of Claim 12, wherein said unique reference  
additionally comprises a reference point, and wherein said at least one processor, if said unique  
reference is sensed by said at least one robot accessor sensor, additionally determines the location  
of said reference point, and said rezero operation is completed.

16. A method for determining positioning in an automated data storage library, said automated data storage library having a plurality of storage shelves for storing data storage media; at least one data storage drive for reading and/or writing data with respect to said data storage media; and at least one robot accessor for transporting said data storage media between  
5 said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor, and said automated data storage library having at least one home position for said at least one robot accessor; said automated data storage library additionally comprising at least one reference point located at an expected location in said automated data storage library remote from said robot accessor home position; said method comprising the steps  
10 of:

conducting a rezero operation in accordance with a calibration system, comprising:

moving said robot accessor sensor to said expected location of said at least one reference point; and

if said one reference point is sensed by said robot accessor sensor at substantially said  
15 expected location, said rezero operation is completed.

17. The method of Claim 16, additionally comprising, during said rezero operation:

if said one reference point is sensed by said robot accessor; comparing said sensed location of said one reference point to said expected location; and

if said comparison indicates an offset between said sensed location and said expected location of said one reference point, updating said calibration system with respect to said one reference point and said rezero operation is completed.

18. The method of Claim 16, additionally comprising, during said rezero operation:

if said one reference point is sensed by said robot accessor, comparing said sensed location of said one reference point to said expected location;

10 if said comparison indicates an offset between said sensed location and said expected location of said one reference point, moving said robot accessor to a second expected location of a second reference point; and

if said second reference point is sensed by said robot accessor sensor at substantially said second expected location, updating said calibration system with respect to said one reference point, and said rezero operation is completed.

19. The method of Claim 16, additionally comprising, during said rezero operation:

if said one reference point is sensed, comparing said sensed location of said one reference point to said expected location of said one reference point;

if said comparison indicates an offset between said sensed location and said expected location of said one reference point, moving said robot accessor to a second expected location of a second reference point;

if said second reference point is sensed but is offset from said second expected position, determining whether said offset of said second reference point is consistent with said offset of said one reference point; and

10 if said offsets are consistent, updating said calibration system with respect to said one reference point and/or said second reference point, and completing said rezero operation.

20. A method for determining positioning in an automated data storage library, said automated data storage library having a plurality of storage shelves for storing data storage media; at least one data storage drive for reading and/or writing data with respect to said data storage media; and at least one robot accessor for transporting said data storage media between
- 5 said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor, and said automated data storage library having at least one home position for said at least one robot accessor; said automated data storage library additionally comprising at least one unique reference at an unique location in said automated data storage library; said method comprising the steps of:
- 10 conducting a rezero operation in accordance with a calibration system, comprising:  
moving said robot accessor sensor toward said unique location of said unique reference and/or said home position; and  
if said unique reference is sensed by said robot accessor sensor, determining said unique location and completing said rezero operation.
- 15 21. The method of Claim 20, additionally comprising, during said rezero operation:  
if said unique reference is found, said step of completing said rezero operation comprises moving said robot accessor to said home position at high speed.

22. The method of Claim 20, wherein said automated data storage library additionally comprises at least one reference point located at an expected location in said automated data storage library remote from said robot accessor home position; said method additionally comprising, during said rezero operation:

5 if said unique reference is sensed by said robot accessor sensor, employing said determined unique location to move said robot accessor sensor to said expected location of said reference point; and

if said reference point is sensed by said robot accessor sensor at substantially said expected location, said rezero operation is completed.

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23. A computer program product usable with at least one programmable computer processor having computer readable code embodied therein, said at least one programmable computer processor for operating said at least one robot accessor of an automated data storage library in accordance with a calibration system to conduct a rezero operation, said automated data storage  
5 library having a plurality of storage shelves for storing data storage media; at least one data storage drive for reading and/or writing data with respect to said data storage media; and at least one robot accessor for transporting said data storage media between said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor, and said automated data storage library having at least one home position for said at least one  
10 robot accessor; said automated data storage library additionally comprising at least one reference point located at an expected location in said automated data storage library remote from said robot accessor home position; said computer program product comprising:  
computer readable program code causing said at least one programmable computer processor to move said robot accessor sensor to said expected location of said at least one  
15 reference point; and  
computer readable program code causing said at least one programmable computer processor to, if said one reference point is sensed by said robot accessor sensor at substantially said expected location, said rezero operation is completed.



24. The computer program product of Claim 23, additionally comprising:

computer readable program code causing said at least one programmable computer processor to, if said one reference point is sensed by said robot accessor, compare said sensed location of said one reference point to said expected location; and

5 computer readable program code causing said at least one programmable computer processor to, if said comparison indicates an offset between said sensed location and said expected location of said one reference point, update said calibration system with respect to said one reference point and said rezero operation is completed.

25. The computer program product of Claim 23, additionally comprising:

computer readable program code causing said at least one programmable computer processor to, if said one reference point is sensed by said robot accessor, compare said sensed location of said one reference point to said expected location;

5 computer readable program code causing said at least one programmable computer processor to, if said comparison indicates an offset between said sensed location and said expected location of said one reference point, move said robot accessor to a second expected location of a second reference point; and

computer readable program code causing said at least one programmable computer  
10 processor to, if said second reference point is sensed by said robot accessor sensor at substantially said second expected location, update said calibration system with respect to said one reference point, and said rezero operation is completed.

26. The computer program product of Claim 23, additionally comprising:

computer readable program code causing said at least one programmable computer to, if  
15 said one reference point is sensed, compare said sensed location of said one reference point to said expected location of said one reference point;

computer readable program code causing said at least one programmable computer to, if  
said comparison indicates an offset between said sensed location and said expected location of  
said one reference point, move said robot accessor to a second expected location of a second  
20 reference point;

computer readable program code causing said at least one programmable computer processor to detect if said second reference point is offset from said second expected location;

computer readable program code causing said at least one programmable computer processor to, if said second reference point is offset from said second expected position,

5 determine whether said offset of said second reference point is consistent with said offset of said one reference point; and

computer readable program code causing said at least one programmable computer processor to, if said offsets are consistent, update said calibration system with respect to said one reference point and/or said second reference point, and complete said rezero operation.

27. A computer program product usable with at least one programmable computer processor having computer readable code embodied therein, said at least one programmable computer processor for operating said at least one robot accessor of an automated data storage library in accordance with a calibration system to conduct a rezero operation, said automated data storage  
5 library having a plurality of storage shelves for storing data storage media; at least one data storage drive for reading and/or writing data with respect to said data storage media; and at least one robot accessor for transporting said data storage media between said plurality of storage shelves and said at least one data storage drive; said robot accessor having at least one sensor, and said automated data storage library having at least one home position for said at least one  
10 robot accessor; said automated data storage library additionally comprising at least one unique reference at an unique location in said automated data storage library; said computer program product comprising:

computer readable program code causing said at least one programmable computer processor to move said robot accessor sensor toward said unique location of said unique  
15 reference and/or said home position; and

computer readable program code causing said at least one programmable computer processor to, if said unique reference is sensed by said robot accessor sensor, determine said unique location and complete said rezero operation.

28. The computer program product of Claim 27, additionally comprising:

computer readable program code causing said at least one programmable computer processor to, if said unique reference is found, move said robot accessor to said home position at high speed.

5 29. The computer program product of Claim 27, wherein said automated data storage library additionally comprises at least one reference point located at an expected location in said automated data storage library remote from said robot accessor home position; said computer program product additionally comprising:

10 computer readable program code causing said at least one programmable computer processor to, if said unique reference is sensed by said robot accessor sensor, employ said determined unique location to move said robot accessor sensor to said expected location of said reference point; and

computer readable program code causing said at least one programmable computer processor to, if said reference point is sensed by said robot accessor sensor at substantially said  
15 expected location, said rezero operation is completed.

30. The computer program product of Claim 27, wherein said unique reference additionally comprises a reference point, and wherein said computer program product additionally comprises computer readable program code causing said at least one programmable computer processor to, if said unique reference is sensed by said at least one robot accessor sensor, additionally  
20 determine the location of said reference point, and said rezero operation is completed.